

September 6, 2005

Mr. L. William Pearce  
Vice President  
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Beaver Valley Power Station  
Post Office Box 4  
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 (BVPS-1 AND 2) -  
RESPONSE TO NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS  
BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-  
WATER REACTORS (TAC NOS. MB9554 AND MB9555)

Dear Mr. Pearce:

This letter acknowledges receipt of your response dated August 8, 2003, to Nuclear Regulatory Commission (NRC) Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors [PWRs]," dated June 9, 2003, as well as acknowledging receipt of your responses dated June 15, 2004, and June 17, 2005, to our request for additional information (RAI) dated May 12, 2004. The NRC issued Bulletin 2003-01 to all PWR licensees requesting that they provide a response, within 60 days of the date of Bulletin 2003-01, that contains the information requested in following either Option 1 or Option 2 as stated in Bulletin 2003-01:

- Option 1: State that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the Discussion section, and are in compliance with all existing applicable regulatory requirements.
- Option 2: Describe any interim compensatory measures that have been implemented or that will be implemented to reduce the risk which may be associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete. If any of the interim compensatory measures listed in the Discussion section will not be implemented, provide a justification. Additionally, for any planned interim measures that will not be in place prior to your response to this bulletin, submit an implementation schedule and provide the basis for concluding that their implementation is not practical until a later date.

You provided an Option 2 response.

Bulletin 2003-01 discussed six categories of interim compensatory measures (ICMs): (1) operator training on indications of and responses to sump clogging; (2) procedural modifications if appropriate, that would delay the switchover to containment sump recirculation (e.g., shutting down redundant pumps that are not necessary to provide required flows to cool

the containment and reactor core, and operating the CSS intermittently); (3) ensuring that alternative water sources are available to refill the RWST [refueling water storage tank] or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere; (4) more aggressive containment cleaning and increased foreign material controls; (5) ensuring containment drainage paths are unblocked; and (6) ensuring sump screens are free of adverse gaps and breaches.

You stated in your August 8, 2003, bulletin response that you have either implemented the following measures, or that these measures were already in place:

- (1) licensed operator training on indications of and responses to sump clogging - ICM category #1;
- (2) emergency procedures to increase/conservate RWST level upon loss of emergency coolant recirculation - ICM category #3;
- (3) emergency procedures to refill the RWST from borated and unborated sources - ICM category #3;
- (4) emergency procedures to inject into the reactor coolant system (RCS) from various borated sources, and alternate non-borated sources to be utilized under the Severe Accident Management Guidelines - ICM category #3;
- (5) foreign material exclusion procedures for containment, containment cleaning, and containment inspection and walkdown - ICM category #4;
- (6) containment drainage path blockage prevention design features and inspections - ICM category #5; and
- (7) a containment sump function test and a containment sump screen inspection - ICM category #6.

You also stated in your August 8, 2003, response that you would not be implementing the following interim compensatory measures: (1) changes to emergency operating procedures (EOPs) that take pre-emptive operator actions to shut off one train of ECCS and/or CSS, or (2) throttling ECCS flow solely for the purpose of delaying switchover to containment sump recirculation. You stated that such changes were to be considered after the Westinghouse Owners Group (WOG) evaluates their impact.

In a June 15, 2004, response to the NRC staff's May 12, 2004, RAI, you discussed the following considerations and actions:

- (1) the creation of a new containment sump blockage control room guideline - ICM category #1 (noting that plant-specific differences between BVPS-1 and 2 and the WOG WCAP-16204, "Candidate Operator Actions (COAs)," reference plant will need to be addressed prior to implementing the plant-specific guidelines, specifically noting that BVPS-1 and 2 have separate low head safety injection pumps and residual heat removal pumps, and that the units also do not utilize containment air coolers during accident situations);
- (2) evaluation results of WCAP-16204 (establishing their acceptability or unacceptability,

including justifications for not planning to implement any COAs falling within ICM category #2);

(3) a regulatory commitment to implement certain WCAP-16204 COAs; and

(4) a detailed description of how your current EOPs address a loss of ECCS recirculation capability.

In your June 15, 2004, RAI response, you discussed your consideration of the WOG COAs as follows:

(1) COA A1a-W, "Operator Action to Secure One Spray Pump," concluding that because BVPS-1 and 2 do not use containment fan coolers under accident conditions, this COA would not be implemented;

(2) COA A1b-W, "Operator Action to Secure Both Spray Pumps," concluding that because BVPS-1 and 2 do not use containment fan coolers under accident conditions, this COA would not be implemented;

(3) COA A2, "Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation," concluding that, since this COA requires that spray must be secured, this COA would not be implemented (see COA A1a above);

(4) COA A3-W, "Terminate One Train of Safety Injection After Recirculation Alignment," concluding that since there is no procedural guidance for throttling recirculation flowrate at either unit, which would possibly be preferable, this COA will be incorporated into the BVPS-1 and 2 EOPs - ICM category 1;

(5) COA A4, "Early Termination of One LPSI/RHR [low pressure safety injection/residual heat removal] Pump Prior to Recirculation Alignment," concluding that this COA was appropriate only for Combustion Engineering (CE) plant designs (where low-pressure and high-pressure pumps are independent), unlike the BVPS-1 and 2 Westinghouse design (where the low-pressure pumps provide suction for the high-pressure pumps), and that, therefore, this COA would not be implemented;

(6) COA A5, "Refill of Refueling Water Storage Tank [RWST]," concluding that existing RWST make-up procedures will be revised to initiate these actions "in anticipation of potential loss of recirculation capability," rather than after evidence of that loss appears - ICM category #3;

(7) COA A6, "Inject More Than One RWST Volume From a Refilled RWST or By Bypassing the RWST," concluding that procedural guidance will be established to conditionally take actions to inject more than one RWST volume into the containment at each unit (when there is a need to regain core heat removal upon loss of sump recirculation);

(8) COA A7, "Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA [loss-of-cooling accident]," concluding (in this case, in your bulletin response of August 8, 2003) that for smaller LOCAs it is possible (and directed in WOG Emergency Response Guideline ES-1.2, "Post LOCA Cooldown and Depressurization," used at BVPS-1 and 2) to cooldown and depressurize the RCS to cold shutdown conditions before the RWST is drained to the switchover level, thereby eliminating the need to establish recirculation and

making sump blockage a non-issue - ICM category #2;

(9) COA A8-W, "Provide Guidance on Symptoms and Identification of Containment Sump Blockage," concluding that the EOPs at BVPS-1 and 2 will be updated to include guidance on identifying sump blockage and transitioning to the BVPS-1 and 2 version of the WOG Sump Blockage Control Room Guideline (SBCRG) from WCAP-16204 - ICM category #1;

(10) COA A9-W, "Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation," concluding that this guidance will be developed and included in the BVPS-1 and 2 version of the SBCRG;

(11) COA A10, "Termination of One Train of HPSI [high pressure safety injection]/High-Head Injection Prior to Recirculation Alignment," concluding that this COA was evaluated and is applicable to CE-designed reactor plants only, unlike the BVPS-1 and 2 Westinghouse design; and

(12) COA A11, "Prevent or Delay Containment Spray for Small Break LOCAs (<1.0 inch Diameter) in Ice Condenser Plants," concluding that this COA does not apply to BVPS-1 and 2's non-ice condenser containment design.

Your June 17, 2005, RAI response revised your commitment to implement COA A3-W to indicate that this commitment will not be implemented. You concluded that securing one train of safety injection provides a negative potential for increasing core damage that outweighs the potential benefit in sump net positive suction head. It is our understanding that all other actions addressed in your June 15, 2004, response have been implemented as of June 15, 2005.

The NRC staff has considered your Option 2 response for compensatory measures that were or were to have been implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions. Based on your response, the NRC staff considers your actions to be responsive to and meet the intent of Bulletin 2003-01. Please retain any records of your actions in response to Bulletin 2003-01, as the NRC staff may conduct subsequent inspection activities regarding this issue.

Should you have any questions, please contact me at 301-415-1402 or the lead Project Manager for this issue, Mr. Alan Wang, at 301-415-1445.

L. Pearce

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Sincerely,

*/RA/*

Timothy G. Colburn, Senior Project Manager, Section 1  
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Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

cc: See next page

Should you have any questions, please contact me at 301-415-1402 or the lead Project Manager for this issue, Mr. Alan Wang, at 301-415-1445.

L. Pearce

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